PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: Michael FÜRST - 1 (RCE)

SERIAL NO.: 10/680,012 EXAMINER: Catherine A. SIMONE

FILED: OCTOBER 7, 2003 GROUP: 1794

TITLE: FILM-BITUMEN COMBINATION

DECLARATION UNDER RULE 132

MAIL STOP: RCE
Honorable Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

COMMISSIONER:

I, MICHAEL FÜRST, declare as follows:

that I reside at Gruendlein 12, 91332 Heiligenstadt, Germany;

that I am a citizen of Germany;

that I am the Research and Development Manager employed by the Assignee, which is Huhtamaki Forchheim Zweigniederlassung Der Huhtamaki Deutschland GmbH & Co., KG, Zweibruckenstr. 15-25, D-91301 Forchheim, Fed Rep Germany;

that my special field of employment is the use of plastic films in roofing applications;

that I am the sole inventor of U.S. Patent Application Serial No. 10/680,012 filed October 7, 2003;

that I received a copy of the Final Office Action mailed dated August 4, 2008, from the U.S.P.T.O.;

that I read and understand this Final Office Action including the primary reference, *Wiercinski U.S. Patent No. 5,687,517*, which was cited against all the claims in various prior art rejections by the Patent Examiner;

that it is respectfully pointed out that a substantial difference between *Wiercinski* and the present invention is the asymmetric construction of the present invention;

that the combination structure according to *Wiercinski* is built up by two multilayer films 22 and 22A (Fig. 2) as discussed in the Office Action; these two films 22 and 22A are built up by three layers of different material; the multilayer films 22 and 22A are of the same construction; therefore, the *Wiercinski* complete film built by films 22 and 22A is always symmetrical;

that the structure according to the present invention is itself built up by an asymmetric construction that is a substantial and important difference over the prior art; therefore, *Wiercinski* does not disclose the claimed structure set forth in the claims and does not lead to the present invention even if combined with other references *Hurst, Zickell* and *Kaklanoglu*;

that there is a discussion within *Wiercinski*, in column 6, lines 49 and 50 that the non-skid material in this prior art reference should have a lower Young's modulus of elasticity than

the outermost film layer material of the carrier sheet 14; that one possible way to include a convincing showing of unexpected results would be to show that the Young's modulus of elasticity of the materials recited in claims 20 and 21 has a much higher, for example, Young's modulus of elasticity than the materials listed there in *Wiercinski*, in column 6, in lines 52 through 54;

that *Wiercinski*, in claim 1 and in claim 13, specifically recites a coating having a lower Young's modulus of elasticity than the outermost film layer;

that while this prior art reference refers to the *Young's* modulus of elasticity, the present invention recites the thermal expansion coefficient in the claims, and that this is a significant difference;

that *Wiercinski* does not teach, suggest or disclose anything about the thermal expansion of the various layers in the prior art structure; and that this is a substantial difference;

that regarding the pending claims, it is to be pointed out that in claim 32 that a first film layer being located further away from the bituminous layer has a larger coefficient of thermal expansion than a second film layer;

that therefore, the claimed invention is directed to an asymmetric construction; this feature must always be structurally present; therefore, all layers further away from the bituminous layer must have a greater thermal expansion than a layer located nearer to the bituminous layer.

That the following are the results of tests I conducted and which are to be reported:

A construction according to *Wiercinski*:

Thermal Expansion of the layers (references according to those shown in Fig. 2 of *Wiercinski*):

24/24A: LLDPE or LDPE: LLDPE: $20*10^{-5}K^{-1}$ LDPE: $17*10^{-5}K^{-1}$

26/26A: HDPE or PP: HDPE: $20*10^{-5}K^{-1}$ PP: $12*10^{-5}K^{-1}$

28/28A: LLDPE or LDPE: LLDPE: $20*10^{-5}K^{-1}$ LDPE: $17*10^{-5}K^{-1}$

Thermal expansion of the layers of the present invention:

PP: $12*10^{-5}K^{-1}$

LDPE: $17*10^{-5}K^{-1}$

LLDPE: $20*10^{-5}K^{-1}$

HDPE: $20*10^{-5}K^{-1}$

PA: $7.5*10^{-5}K^{-1}$

PET: $8*10^{-5}K^{-1}$

The linear thermal expansion of a plastic layer for a film of 1000m width is around $10^{*-2}mmK^{-1}$. On a roof, temperature differences of more than 100 K are occurring (e.g. in cold winter with sun shining, temperatures of around 70°C are reached on black surfaces without wind. Therefore the linear thermal expansion is between 7.5 and 20mm for a roll of 1000mm in width.

Hence, the difference in thermal expansion between different layers is up to 12.5 mm.

If those different layers are adjacent to each other, significant forces are produced which cause bending of the plastic film construction.

In the prior art, it was attempted to try to compensate for those bending forces by a symmetric construction of the plastic film.

In Appendix "A" the following pictures of those symmetric constructions are shown.

Tests have been made in a thermal test chamber.

Different materials according to the above shown constructions have been put into such a chamber.

40 cycles between -30° and 70°C have been run through. After these tests had been finished, the samples were examined. The results are shown in the above mentioned Appendix "A."

In conclusion, the prior art symmetrical construction lead to material failure, while the claimed "asymmetrical" construction did not fail. This unexpected improvement in results for the claimed invention relative to the prior art structure (i.e.-"asymmetrical" versus "symmetrical" of *Wiercinski*) is very strong indicia of the nonobviousness of the claimed invention.

The deficiencies in the teachings of the primary reference *Wiercinski* are not overcome by the disclosures of the secondary references. None of the other cited prior art references namely: *Hurst, Zickell* and *Kalkanoglu*, teach or suggest the claimed invention.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued

thereon.

Michael Fürst

MICHAEL FÜRST

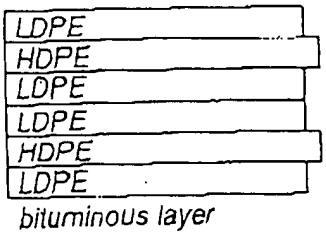
Date: April 4, 2003

Enclosure: APPENDIX A

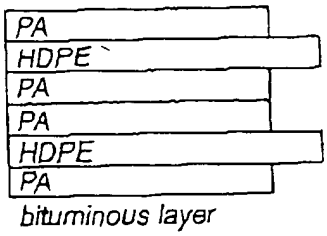
R:\Patente\F\FÜRST, M-1\RCE\Declaration Under Rule 132.wpd

APPENDIX A

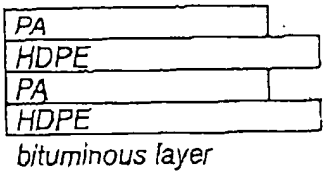
state of the art (e.g. Wlecinski)



no curling, but multilayer film delaminates in spite of low bonding and different thermal expansion in relation to a bituminous layer



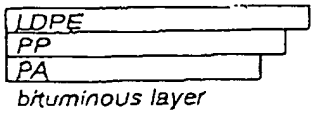
no curling, but multilayer film delaminates in spite of low bonding and different thermal expansion in relation to a bituminous layer



normally no curling, but multilayer film delaminates in spite of low bonding and different thermal expansion in relation to a bituminous layer

The idea of the present invention is to use a asymmetric construction for a multilayer film:

present invention



the multilayer construction produces a force in the direction of the PA layer and consequently to the bituminous layer at higher temperatures around 70 °C occuring at rooftop.
No Delamination.